

## Brian L. Tierney

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### Education

- M.S. Computer Science, San Francisco State University, 1990
- B.A. Physics, Minor in Computer Science, The University of Iowa, 1985

### Positions

- Staff Scientist, Lawrence Berkeley National Laboratory, California, 1990 – Present
- Visiting Scientific Associate, CERN, Geneva, Switzerland 2000-2001
- Research Associate, Lawrence Berkeley National Laboratory, California, 1989 - 1990

### Research Interests

Cyber security and intrusion detection systems; high-performance networking and network protocols; distributed system performance monitoring and analysis; network tuning issues; the application of distributed computing to problems in science and engineering.

### Narrative

Brian L. Tierney is a Staff Scientist and group leader of the Data Intensive Distributed Computing Group, which is part of the Distributed Systems Department at LBNL. He has been the PI for several research projects in network and Grid monitoring systems for data intensive distributed computing. In the past 15 years he has been focusing on performance issues in data intensive distributed computing. He was the principle designer of the Distributed Parallel Storage System (DPSS) and the NetLogger Toolkit. He is co-chair of the “2<sup>nd</sup> International Workshop on Protocols for Long Distance Networks” (PFLDnet), 2004. His current work is in the areas of cyber security and network monitoring.

### Recent Publications

- “Scalable Analysis of Distributed Workflow Traces”, Daniel K. Gunter and Brian L. Tierney, *The 2005 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'05)*, LBNL-57060.
- “Essential Grid Workflow Monitoring Elements”, Daniel K. Gunter, Keith R. Jackson, David E. Konerding, Jason R. Lee and Brian L. Tierney, *The 2005 International Conference on Grid Computing and Applications (GCA'05)*, LBNL-57428.
- “Instrumentation and Monitoring”, B. Tierney and J. Hollingsworth, Chapter 20, *The Grid Blueprint for a New Computing Infrastructure*, 2nd Edition, Elsevier, 2003
- “System Capability Effects on Algorithms for Network Bandwidth Measurement”, G. Jin, B. Tierney, *Proceedings of the Internet Measurement Conference*, Oct. 27-29, 2003, Miami Beach, Florida, LBNL-48556
- “On-Demand Grid Application Tuning and Debugging with the NetLogger Activation Service”, D. Gunter, B. Tierney, C. E. Tull, V. Virmani, *4th International Workshop on Grid Computing (Grid2003)*, LBNL-52991
- “Enabling Network Measurement Portability Through a Hierarchy of Characteristics”, B. Lowekamp, B. Tierney, Les Cottrell, R. Hughes-Jones, T. Kielmann, M. Swany, *4th International Workshop on Grid Computing (Grid2003)*, LBNL-53013.
- “An Infrastructure for Passive Network Monitoring of Application Data Streams”, D. Agarwal, J. M. González, G. Jin, B. Tierney, *Passive and Active Measurement Workshop*, April, 2003.
- “Dynamic Monitoring of High-Performance Distributed Applications”, D. Gunter, B. Tierney, K. Jackson, J. Lee, M. Stoufer, *Proceedings of the 11th IEEE Symposium on High Performance Distributed Computing*, July 2002..
- “Monitoring Data Archives for Grid Environments”, J. Lee, D. Gunter, M. Stoufer, B. Tierney, *Proceeding of IEEE Supercomputing 2002 Conference*, Nov. 2002.
- “A TCP Tuning Daemon”, T. Dunigan, M. Mathis and B. Tierney, *Proceeding of IEEE Supercomputing 2002 Conference*, Nov. 2002.

- “Enabling Network-Aware Applications”, B. Tierney, D. Gunter, J. Lee, M. Stoufer, *Proceedings of the 10th IEEE Symposium on High Performance Distributed Computing*, August 2001.
- "A Monitoring Sensor Management System for Grid Environments", Tierney, B., B. Crowley, D. Gunter, J. Lee, M. Thompson, *Cluster Computing Journal*, vol 4-1, 2001, Baltzer Science Publications.
- “TCP Tuning Guide for Distributed Application on Wide Area Networks”, Tierney, B., *Usenix ;login*, Feb. 2001.
- “File and Object Replication in Data Grids”, Stockinger, H., Samar, A., Allcock, B, Foster, I., Holtman, K., Tierney, B., *Proceedings of the 10th IEEE Symposium on High Performance Distributed Computing (HPDC-10)*, August 2001
- "Using High-Speed WANs and Network Data Caches to Enable Remote and Distributed Visualization", Bethel, W., Tierney, B., Lee, J., Gunter, D., Lau, S., *Proceeding of the IEEE Supercomputing 2000 Conference*, Nov. 2000.
- "A Grid Monitoring Service Architecture", Tierney, B., Ruth Aydt, Dan Gunter, Warren Smith, Valerie Taylor, Rich Wolski, et.al., *Global Grid Forum White Paper*, <http://dsd.lbl.gov/GridPerf/>.
- "A Monitoring Sensor Management System for Grid Environments", Tierney, B., B. Crowley, D. Gunter, M. Holding, J. Lee, M. Thompson, *Proceedings of the IEEE High Performance Distributed Computing (HPDC-9)*, August 2000.
- “A Data Intensive Distributed Computing Architecture for Grid Applications”, Tierney, B., Johnston, W., Lee, J., Thompson, M., *Future Generation Computer Systems Journal*, vol. 16, #5, April 2000, pp. 473-481.
- “A Network-Aware Distributed Storage Cache for Data Intensive Environments”, Tierney, B. Lee, J., Crowley, B., Holding, M., Hylton, J., Drake, F., *Proceedings of IEEE High Performance Distributed Computing*, August 1999.
- “The NetLogger Methodology for High Performance Distributed Systems Performance Analysis”, B. Tierney, W. Johnston, B. Crowley, G. Hoo, C. Brooks, D. Gunter, *Proceeding of IEEE High Performance Distributed Computing*, July 1998.

## Other Significant Publications

- “Performance Analysis in High-Speed Wide Area ATM Networks: Top-to-bottom end-to-end Monitoring”, B. Tierney, W. Johnston, G. Hoo, J. Lee, *IEEE Network*, Vol. 10, no. 3, May/June 1996.
- “System Issues in Implementing High Speed Distributed Parallel Storage Systems”, Brian Tierney, Bill Johnston, Hanan Herzog, Gary Hoo, Guojun Jin, Jason Lee, *Proceedings of the USENIX Symposium on High Speed Networking*, Aug. 1994.
- “Distributed Parallel Data Storage Systems: A Scalable Approach to High Speed Image Servers”, Brian Tierney, Bill Johnston, Ling Tony Chen, Hanan Herzog, Gary Hoo, Guojun Jin, Jason Lee, *Proceedings of the ACM Multimedia*, October 1994.
- “High Performance Computing, High Speed Networks, and Configurable Computing Environments”, W. Johnston, V. Jacobson, D. Robertson, B. Tierney, S. Loken. *High Performance Computing in Biomedical Research*, CRC Press, November 1993.

## Tutorials

Taught half-day or full-day tutorials on performance analysis and tuning of distributed applications at:

- SuperComputing Conference, Nov. 2000
- CERN School of Computing, Sep. 2000
- High Performance Distributed Computing Conference, Aug. 1999

## Recent Collaborators

A. Chien (SDSC), L. Cottrell (SLAC), C. Dovorlis (Georgia Tech), Cees de Laat (U. Amsterdam), T. Dunigan (ORNL), W. Feng (LANL), I. Foster (ANL), D. Gannon (U. Indiana), C. Kesselman (USC/ISI), W. Johnston (ESnet), M. Mathis (PSC), R. Moore (SDSC), R. Mount (SLAC), V. Paxson (LBNL), P. Kunst (CERN), R. Wolski (UT).

## Graduate Students (MS) over past 5 years

Jason Lee (LBNL), Dan Gunter (LBNL), Mason Holding (scale8).

## Selected Professional Activities

- Member of IEEE Computer Society and USENIX